

WHAT IS CLAIMED IS:

1. A Bluetooth private network for communicating with a public network, the Bluetooth private network comprising:
 - a plurality of Bluetooth access points for functioning as base stations, each Bluetooth access point defining a Bluetooth piconet and interfacing between a signal transmitted from the public network and Bluetooth devices within each of Bluetooth piconets;
 - a gateway interfacing between the public network and the Bluetooth private network, sending a beacon signal to each of the Bluetooth devices to locate the Bluetooth devices, and communicating with a home agent of each of the Bluetooth devices to perform authentication of the each of the Bluetooth devices;
 - the Bluetooth device having a power measuring device therein that measures output power signals of a plurality of Bluetooth access points; and
 - a router for functioning as an interface between each of said Bluetooth access points.
2. The Bluetooth private network of claim 1, wherein each one of the Bluetooth access points includes a routing cache for setting a path.
3. The Bluetooth private network of claim 1, further comprising an agent connected to the plurality of Bluetooth access points for performing IP address registration and authentication of the Bluetooth device.
4. The Bluetooth private network of claim 1, further comprising an application server connected to the plurality of Bluetooth access points for providing information requested by the Bluetooth device.
5. The Bluetooth private network of claim 1, wherein the output power signals of the plurality of Bluetooth access points are receiver signal strength indicators (RSSI).

6. The Bluetooth private network of claim 5, wherein the Bluetooth device measures up to four RSSIs from four Bluetooth access points to determine the strongest RSSI to select one of the four Bluetooth access points.

7. The Bluetooth private network of claim 5, wherein the Bluetooth device measures up to four RSSIs from four Bluetooth access points to determine one of the four Bluetooth access points that exceeds a predetermined RSSI level.

8. The Bluetooth private network of claim 3, wherein the output power signals of the plurality of Bluetooth access points are receiver signal strength indicators (RSSI).

9. The Bluetooth private network of claim 8, wherein the Bluetooth device measures up to four RSSIs from four Bluetooth access points to determine the strongest RSSI to select one of the four Bluetooth access points.

10. The Bluetooth private network of claim 8, wherein the Bluetooth device measures up to four RSSIs from four Bluetooth access points to determine one of the four Bluetooth access points that exceeds a predetermined RSSI level.

11. A Bluetooth private network, comprising:
first and second Bluetooth access points, the first Bluetooth access point defining a first Bluetooth piconet, the second Bluetooth access point defining a second Bluetooth piconet;
a gateway connected to the first and the second Bluetooth access points and sending a beacon signal to a Bluetooth device in the first Bluetooth piconet;
the Bluetooth device having a power measuring device therein that measures first and second power strength signals from the first and the second Bluetooth access point, respectively, wherein the Bluetooth device periodically compares the first and the second power strength signals with a predetermined power level; and
a router connected to the first and the second Bluetooth access points for functioning as an interface between each of said Bluetooth access points.

12. The Bluetooth private network of claim 11, wherein the Bluetooth device measures the first and the second power strength signals in a time division manner.

13. The Bluetooth private network of claim 11, wherein the Bluetooth device has a plurality of power measuring devices to concurrently measure a plurality of power strength signals from multiple Bluetooth access points.

14. The Bluetooth private network of claim 11, further comprising a home agent, wherein the gateway communicates with the home agent of the Bluetooth device to perform authentication of the Bluetooth device.

15. The Bluetooth private network of claim 11, wherein each one of the first and the second Bluetooth access points includes a routing cache for setting a communication path.

16. The Bluetooth private network of claim 11, further comprising an agent connected to the first and the second Bluetooth access points for performing IP address registration and authentication of the Bluetooth device.

17. The Bluetooth private network of claim 11, further comprising an application server connected to the first and the second Bluetooth access points for providing information requested by the Bluetooth device.

18. A communication method in a Bluetooth private network, the method comprising the steps of:

(a) transmitting from a gateway a beacon signal to a Bluetooth device for confirming a first piconet to which the Bluetooth device belongs;

(b) upon receiving the beacon signal, transmitting from the Bluetooth device a route update packet to the gateway to set a communication path with the gateway;

(c) transmitting from the Bluetooth device a home IP address and a home agent address to the gateway;

(d) upon receiving a registration request signal in the step (c), allocating from the gateway an address to the Bluetooth device to use the address in the piconet to which the Bluetooth device currently belongs;

(e) registering in the gateway with the address transmitted in the step (d); and

(f) when registered in the step (e), communicating from the Bluetooth device with other communication device in other network through the path set in the step (b).

19. The communication method of claim 18, wherein if the Bluetooth device is moving into a second piconet in said step (f), the method further comprising the steps of:

(g) comparing a transmission power signal from a Bluetooth access point of the first piconet with a transmission power from a Bluetooth access point of a second piconet to determine a movement from the first to the second piconet;

(h) if it is determined that there is movement from the first to the second piconet, transmitting a data packet to the Bluetooth access point of the Bluetooth access point belonging to the first piconet and transmitting a route update packet to the Bluetooth access point belonging to the second piconet to set a new communication path; and

(i) if the new communication path is set in the step (h), transmitting a data packet to the Bluetooth access point of the second piconet.

20. The communication method of claim 18, wherein the path set in the step (b) is stored in a Bluetooth access point routing cache.

21. The communication method of claim 18, wherein the step (e) includes the steps of:

upon receiving the registration request signal, transmitting from the gateway the registration request signal and an address allocated to the Bluetooth device to the home agent of the Bluetooth device which requested registration; and

upon receiving the address, transmitting from the home agent a registration permission signal to the gateway, and sending from the gateway the transmitted registration permission signal to the Bluetooth device.